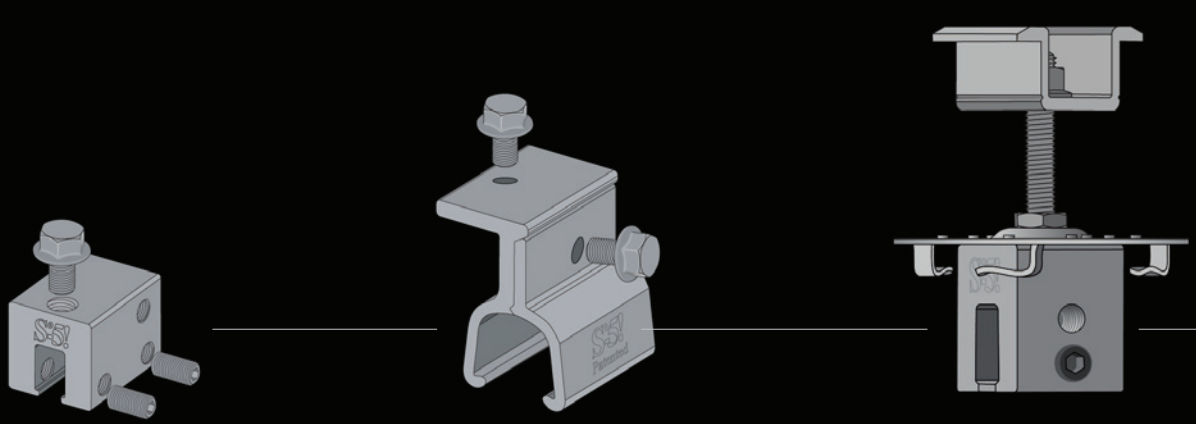
S-5!®
The Right Way!

User Guide | Australia Edition



AUG7-13

S-5! Attachment Solutions | Metal Roof Innovations, LTD. | www.S-5au.com | +1-719-825-3432

J I M W I L S O N P T Y L T D

C O N S U L T I N G E N G I N E E R S

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08th October 2013

Job No. 3393

Mr D Haddock
Product and System Development Manager
S-5! Attachment Solutions
8655 Table Butte Road
Colorado Spring

Dear Dustin,

USER GUIDE AUSTRALIA EDITION
DOCUMENT AUG7-13

The allowable spacings for roof clamps as supplied by S-5! Attachment Solutions have been checked as requested, based on the following:

- Roof clamps as supplied by S-5!, installed in accordance with S-5! Recommendations
- Wind Loads to Australian Standard AS 1170.2 – 2011
- Roof clamp capacities as determined by prototype testing to Australian Standard AS 1170.0 – 2002
- Building height and shape limitations, wind topographical and terrain category limitations, and allowable positioning of panels on building roofs all as detailed in the "User Guide Australia Edition" Document AUG7-13.

The clamp spacings in the "User Guide Australia Edition" Document AUG7-13 are considered to meet the strength requirements for fixing to steel roof sheeting profiles as listed in the guide.

Whilst the strength of the roof clamp fixing has been checked, we have not checked the other items in an installation such as the strength of the panels, support rails, roof sheeting, fixing of roof sheeting to the support structure, and the strength of the support structure.

Our checking is based on analysis and testing carried out up to August 2013. Subsequent analysis and testing when carried out may result in modifications of the clamp spacings in the guide.

Yours Sincerely,

J. E. C. WILSON
DIRECTOR

S-5!®
The Right Way!

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Welcome

Introduction

S-5!® Australian Code Compliant Planning and Installation in accordances with AS/NZS1170

S-5! patented hardware technology makes these attachments quick, simple, secure, and as dependable as the roof systems they complement.

Please review this manual thoroughly before installing an S-5! clamp or bracket with either the S-5-PV Kit or a third party solar mounting application system. This manual provides (1) supporting documentation for building permit applications relating to the range of S-5! clamps used with a third party mounting system, (2) installation conditions, and (3) planning and installation instructions for use of S-5! products.

S-5! products, when installed in accordance with this guide, will be structurally adequate in accordance with AS/NZS1170 standards. During installation, and especially when working on the roof, be sure to observe the appropriate safety regulations, and please pay attention to the relevant regulations of your local region. Any loads imposed on the S-5! clamp will be transferred to the roof sheets. Roof sheets must be adequately attached to building structure to resist these loads. The user and/or the installer of these parts are responsible for all necessary engineering and design for the intended use of these parts in an assembly or application.

Please check that you are using the current version of the installation manual by contacting MAK Fastener Specialists Pty Ltd, via email at **Sales@MakFasteners.com.au**

MAK Fasteners: +61 (0)8 7481 6111

Responsibility

The installer is solely responsible for:

- Complying with all applicable local or national building codes, including any that may supersede this manual.
- Ensuring that S-5!® and other products are appropriate for the particular installation and the installation environment.
- Ensuring that the roof, its structural frame, connections, and other structural support members can support the array under all relevant loading conditions (this total assembly is hereafter referred to as the *roof framing assembly*).
- Ensuring safe installation of all electrical aspects of the PV array.

Loads imposed on the S-5! clamps and brackets will be transferred to the roof sheeting and roof sheeting fixings. Roof sheeting, roof sheeting fixings, and roof supporting structure must have sufficient strength to carry all applicable loads. The makers of S-5! clamps and brackets make no representations with respect to these variables. It is the responsibility of the user to verify this information, or seek assistance from a qualified design professional, if necessary.

The manufacturer expresses no opinions as to the suitability of the S-5! clamp or bracket for any specific application or project condition.

ALWAYS PROVIDE WORKER FALL PROTECTION WHEN INSTALLING S-5!. S-5! DOES NOT APPROVE PRODUCTS FOR USE IN PERSONAL FALL RESTRAINT/FALL PROTECTION APPLICATIONS. S-5! PRODUCTS MAY BE USED AS A COMPONENT IN A FALL PROTECTION SYSTEM ONLY WHEN THE SYSTEM MANUFACTURER PROVIDES APPROPRIATE APPROVALS!

Before proceeding, note the following:

- This document addresses only wind loads on the assumption that wind produces the maximum load factor affecting an installation. Verify that other local factors, such as snow loads and earthquake effects, do not exceed the wind loads; precedence shall be given to any factor that does. Wind loads are considered to act on the entire projected area, or may be perpendicular to any surface.
- For critical installations, inquire for specific test data of ultimate tensile load on specific panel materials and seam types. When tabled values are used, fastener tensions should be verified and factors of safety should be used as appropriate.

Code-Compliant Planning:

This document is designed to assist with installations utilizing S-5! clamps in conjunction with third party product applications in accordance with AS/NZS1170.

Wind Regions

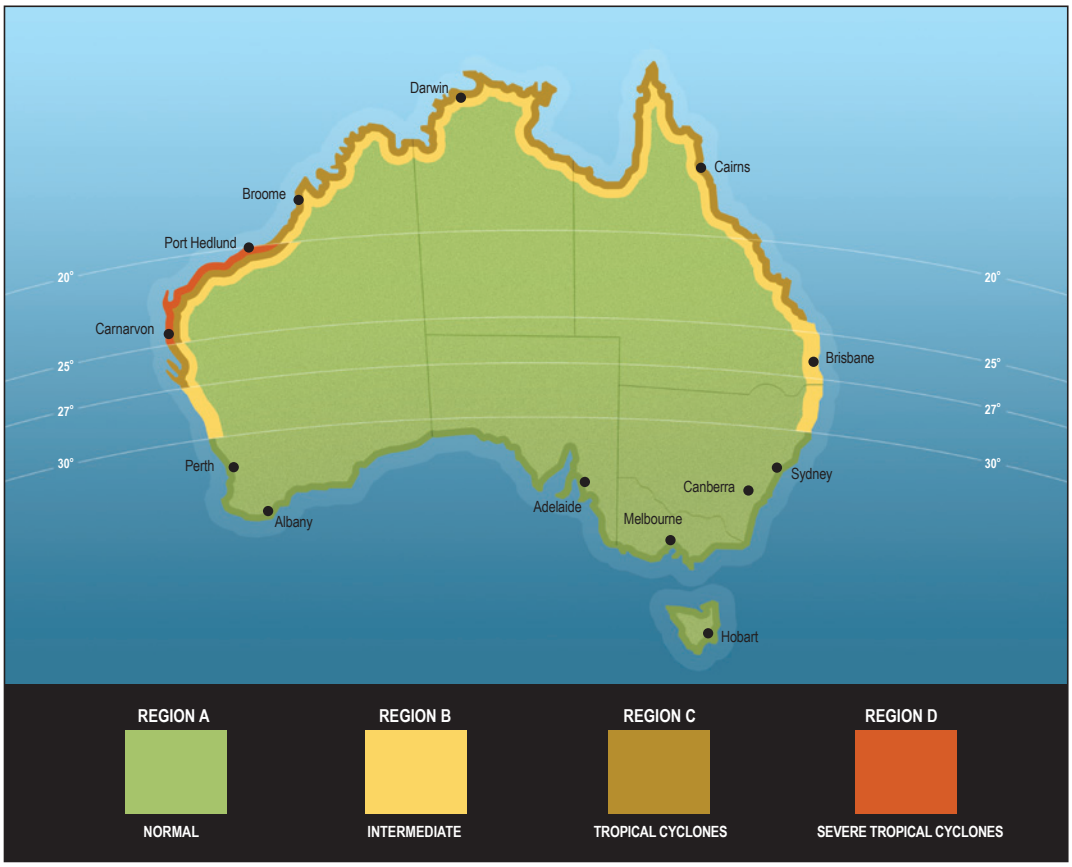
1. Determine the Wind Region of Your Installation Site

Region Definition:

Wind Regions are pre-defined for all of Australia by Australian Standard 1170. The Wind Region does not reflect surrounding topography or buildings. Wind speeds are defined for each region and the design wind speeds are based on the region wind speed, modified as necessary to reflect the effects of local topography, shielding, building height, etc.

Much of Australia is designated Region A which indicates a Regional Ultimate Basic Wind Velocity of 45msec. Some areas are designated Region B (57msec). Local authorities will advise if this applies in your area. Region C areas (69msec) are generally referred to as cyclonic and are generally limited to northern coastal areas. Most Region C zones end 50km - 100km inland. Region D (88msec) Australia's worst Cyclonic Region between Carnarvon and Pardoo in Western Australia.

Australian wind region map:



Installation Planning

2. Installation Conditions

- Wind loads to AS1170.2:2011
- Wind average recurrence interval of 500 years
- Wind terrain Category 2
- Shielding and topography multipliers, equal to 1.0
- Racks mounted on roofs of enclosed buildings of nominal rectangular shape
- Roof cladding: suitable for most types of metal concealed fix roof
- Roof slopes from 0° up to 60° from horizontal
- Maximum solar panel area of 1.5 m^2
- Minimum of 4 clamps supporting each panel (S-5-PV Kit Installations)
- Maximum solar panel weight of 22kg/m^2
- Roof structure to be checked and certified as suitable for applied rack loads prior to installation
- Solar panels to be certified by manufacturer as able to resist wind loads in accordance with AS1170.2:2011

3. Planning and Installation Instructions for Use of S-5!® Clamps and Brackets

Determine the height of your installation site.
This document provides sufficient information for PV assembly installation height less than 20 meters. If your installation site is more than 20 meters in height, please obtain engineering approval, and engineering data to support your installation.

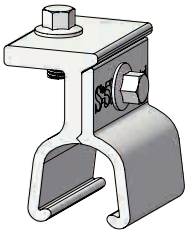
When the installation site is more than 10 meters in height and in Region C utilizing any form of a tilted system, further engineering approval is necessary to support this type of installation.

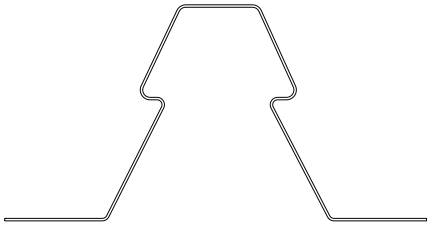
If roofing profile is not listed within this guide, please consult S-5! for clamp suitability.

The following tables assume that determination has been made that the PV modules, PV railing and the roof itself to which the S-5! clamps will be attached is structurally adequate. The makers of S-5! clamps make no representations with respect to these variables. It is the responsibility of the user to verify this information, or seek assistance from a qualified design professional, if necessary.

Wind Region Specs

S-5-K 700





Roof Profiles:

- BlueScope / LYSAGHT - Klip-lok 700 HI-STRENGTH®/ Klip-lock Classic® 700
- Stramit - Speed Deck Ultra®
- Fielders - KingKlip®
- Metroll - Metlok 700®

The following table represents the number of clamps along one side of the module frame using the S-5-PV Kit and EdgeGrab™

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (NO. OF CLAMPS)		REGION B (NO. OF CLAMPS)		REGION C (NO. OF CLAMPS)		REGION D (NO. OF CLAMPS)	
		MG	EG	MG	EG	MG	EG	MG	EG
	5 Meters	2	2	3	2	6	3	**	**
	10 Meters	2	2	3	2	8	4	**	**
	15 Meters	2	2	3	2	8	4	**	**
	20 Meters	2	2	3	2	**	**	**	**

S-5-PV Kit = MG EdgeGrab = EG

**Please inquire for load test reports

The following table represents clamp spacing with a **rail support**.

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (MM)	REGION B (MM)	REGION C (MM)	REGION D (MM)
	5 Meters	1400	900	350	250
	10 Meters	1200	800	300	210
	15 Meters	1000	730	250	180
	20 Meters	1000	700	250	180

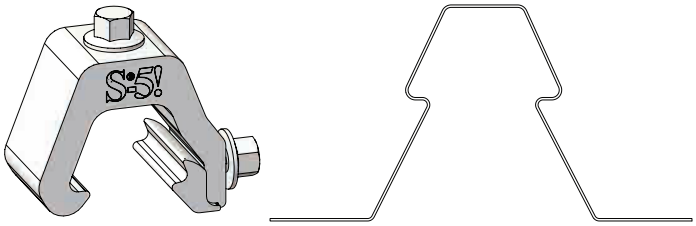
The following table represents clamp spacing (module tilt parallel to roof pitch) or rail spacing (module tilt perpendicular to roof pitch) with a 30° tilted rail support.

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	MODULE TILT PARALLEL TO ROOF PITCH (CLAMP)		MODULE TILT PERPENDICULAR TO ROOF PITCH (RAIL)	
		REGION A (MM)	REGION B (MM)	REGION A (MM)	REGION B (MM)
	5 Meters	1210	810	1550	990
	10 Meters	1000	670	1280	840
	15 Meters	910	610	1170	770
	20 Meters	860	570	1100	730

The figures above are based on attaching PV modules that are 1.5m^2 weighing 22kg. These figures should be sufficient for installing smaller PV modules. These figures also assume that determination has been made that the PV support rail, which is attached to the S-5!® clamps or brackets, is structurally adequate.

Wind Region Specs

S-5-K Grip Mini – GXM 50 Insert



Roof Profiles:

- BlueScope / LYSAGHT - Klip-lok 700 HI-STRENGTH® / Klip-lok Classic® 700
- Stramit - Speed Deck Ultra®
- Fielders - KingKlip®
- Metroll - Metlok 700®

The following table represents the number of clamps along one side of the module frame using the S-5-PV Kit and EdgeGrab™

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (NO. OF CLAMPS)		REGION B (NO. OF CLAMPS)		REGION C (NO. OF CLAMPS)		REGION D (NO. OF CLAMPS)	
		MG	EG	MG	EG	MG	EG	MG	EG
	5 Meters	3	2	4	2	6	3	**	**
	10 Meters	3	2	5	3	7	4	**	**
	15 Meters	3	2	5	3	7	4	**	**
	20 Meters	4	2	6	3	8	4	**	**

S-5-PV Kit = MG EdgeGrab = EG **Please inquire for load test reports

The following table represents clamp spacing with a **rail support**.

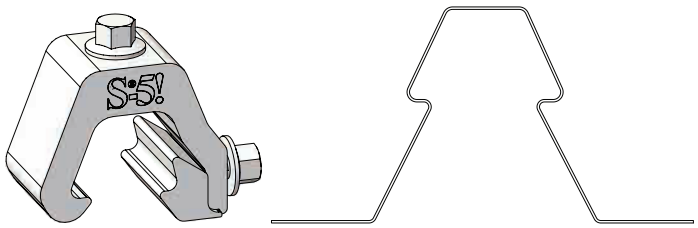
AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (MM)	REGION B (MM)	REGION C (MM)	REGION D (MM)
	5 Meters	800	500	400	270
	10 Meters	700	450	350	238
	15 Meters	600	420	300	204
	20 Meters	600	400	300	204

The following table represents clamp spacing (module tilt parallel to roof pitch) or rail spacing (module tilt perpendicular to roof pitch) with a 30° tilted rail support.

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	MODULE TILT PARALLEL TO ROOF PITCH (CLAMP)		MODULE TILT PERPENDICULAR TO ROOF PITCH (RAIL)	
		REGION A (MM)	REGION B (MM)	REGION A (MM)	REGION B (MM)
	5 Meters	700	460	900	600
	10 Meters	580	380	750	500
	15 Meters	530	350	680	450
	20 Meters	500	330	640	420

The figures above are based on attaching PV modules that are 1.5m^2 weighing 22kg. These figures should be sufficient for installing smaller PV modules. These figures also assume that determination has been made that the PV support rail, which is attached to the S-5!® clamps or brackets, is structurally adequate.

S-5-K Grip Mini – GXM 10 Insert



Roof Profiles:

- BlueScope / LYSAGHT - Klip-lok® 406

The following table represents the number of clamps along one side of the module frame using the S-5-PV Kit and EdgeGrab™

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (NO. OF CLAMPS)		REGION B (NO. OF CLAMPS)		REGION C (NO. OF CLAMPS)		REGION D (NO. OF CLAMPS)	
		MG	EG	MG	EG	MG	EG	MG	EG
	5 Meters	2	2	3	2	4	2	6	3
	10 Meters	2	2	3	2	5	3	8	4
	15 Meters	2	2	4	2	6	3	9	5
	20 Meters	3	2	4	2	6	3	**	**

S-5-PV Kit = MG EdgeGrab = EG **Please inquire for load test reports

The following table represents clamp spacing with a **rail support**.

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (MM)	REGION B (MM)	REGION C (MM)	REGION D (MM)
	5 Meters	1300	860	570	400
	10 Meters	1080	700	470	330
	15 Meters	980	640	430	300
	20 Meters	920	610	400	280

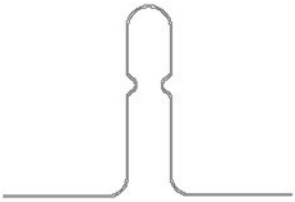
The following table represents clamp spacing (module tilt parallel to roof pitch) or rail spacing (module tilt perpendicular to roof pitch) with a 30° tilted rail support.

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	MODULE TILT PARALLEL TO ROOF PITCH (CLAMP)		MODULE TILT PERPENDICULAR TO ROOF PITCH (RAIL)	
		REGION A (MM)	REGION B (MM)	REGION A (MM)	REGION B (MM)
	5 Meters	1100	720	1440	930
	10 Meters	900	590	1170	760
	15 Meters	820	540	1060	700
	20 Meters	770	510	990	660

The figures above are based on attaching PV modules that are 1.5m^2 weighing 22kg. These figures should be sufficient for installing smaller PV modules. These figures also assume that determination has been made that the PV support rail, which is attached to the S-5!® clamps or brackets, is structurally adequate.

Wind Region Specs

S-5-S Mini



0.7 BMT Roof Profiles:

- BlueScope / LYSAGHT - LONGLINE 305®
- Stramit - Snaptite®
- Fielders - SNAPLOK

The following table represents the number of clamps along one side of the module frame using the S-5-PV Kit and EdgeGrab™

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (NO. OF CLAMPS) S-5-PV KIT	REGION A (NO. OF CLAMPS) EDGEGRAB™	REGION B (NO. OF CLAMPS) S-5-PV KIT	REGION B (NO. OF CLAMPS) EDGEGRAB™
	5 Meters	2	2	2	2
	10 Meters	2	2	2	2
	15 Meters	2	2	2	2
	20 Meters	2	2	2	2

The following table represents clamp spacing with a **rail support**.

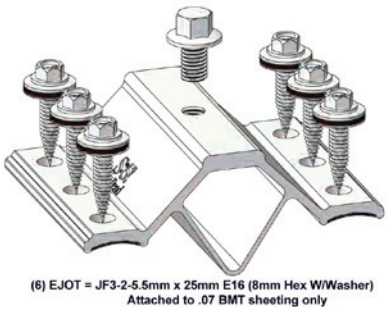
AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (MM)	REGION B (MM)	REGION C (MM)	REGION D (MM)
	5 Meters	2500	1800	N/A	N/A
	10 Meters	2100	1500	N/A	N/A
	15 Meters	1900	1300	N/A	N/A
	20 Meters	1800	1200	N/A	N/A

The following table represents clamp spacing (module tilt parallel to roof pitch) or rail spacing (module tilt perpendicular to roof pitch) with a 30° tilted rail support.

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	MODULE TILT PARALLEL TO ROOF PITCH (CLAMP)		MODULE TILT PERPENDICULAR TO ROOF PITCH (RAIL)	
		REGION A (MM)	REGION B (MM)	REGION A (MM)	REGION B (MM)
	5 Meters	2100	1500	3000	2000
	10 Meters	1750	1250	2450	1600
	15 Meters	1600	1150	2250	1500
	20 Meters	1500	1080	2100	1300

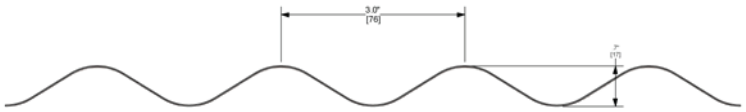
The figures above are based on attaching PV modules that are 1.5m^2 weighing 22kg. These figures should be sufficient for installing smaller PV modules. These figures also assume that determination has been made that the PV support rail, which is attached to the S-5!® clamps or brackets, is structurally adequate.

TopFix CorruBracket-AU™ – 0.7 BMT



0.7 BMT Roof Profiles:

- Corrugated Roof



The following table represents the number of clamps along one side of the module frame using the S-5-PV Kit and EdgeGrab™

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (NO. OF CLAMPS) S-5-PV KIT	REGION A (NO. OF CLAMPS) EDGEGRAB™	REGION B (NO. OF CLAMPS) S-5-PV KIT	REGION B (NO. OF CLAMPS) EDGEGRAB™
	5 Meters	2	2	2	2
	10 Meters	2	2	2	2
	15 Meters	2	2	2	2
	20 Meters	2	2	2	2

The following table represents clamp spacing with a **rail support**.

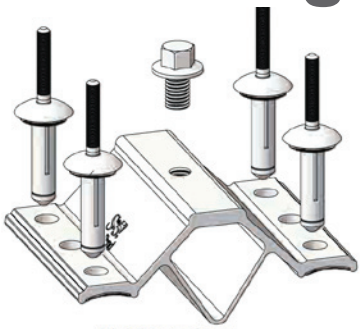
AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (MM)	REGION B (MM)	REGION C (MM)	REGION D (MM)
	5 Meters	1800	1200	N/A	N/A
	10 Meters	1500	1000	N/A	N/A
	15 Meters	1400	900	N/A	N/A
	20 Meters	1300	800	N/A	N/A

The following table represents clamp spacing (module tilt parallel to roof pitch) or rail spacing (module tilt perpendicular to roof pitch) with a 30° tilted rail support.

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	MODULE TILT PARALLEL TO ROOF PITCH (CLAMP)		MODULE TILT PERPENDICULAR TO ROOF PITCH (RAIL)	
		REGION A (MM)	REGION B (MM)	REGION A (MM)	REGION B (MM)
	5 Meters	1500	1050	2100	1400
	10 Meters	1300	900	1850	1100
	15 Meters	1200	800	1500	1000
	20 Meters	1050	675	1200	850

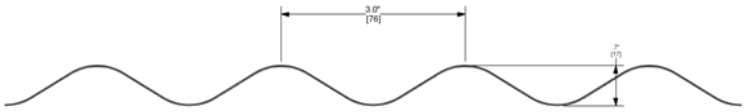
The figures above are based on attaching PV modules that are 1.5m^2 weighing 22kg. These figures should be sufficient for installing smaller PV modules. These figures also assume that determination has been made that the PV support rail, which is attached to the S-5![®] clamps or brackets, is structurally adequate.

Wind Region Specs



0.5 BMT Roof Profiles:

- Corrugated Roof



The following table represents the number of clamps along one side of the module frame using the S-5-PV Kit and EdgeGrab™

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (NO. OF CLAMPS) S-5-PV KIT	REGION A (NO. OF CLAMPS) EDGEGRAB™	REGION B (NO. OF CLAMPS) S-5-PV KIT	REGION B (NO. OF CLAMPS) EDGEGRAB™
	5 Meters	2	2	2	2
	10 Meters	2	2	2	2
	15 Meters	2	2	2	2
	20 Meters	2	2	2	2

The following table represents clamp spacing with a **rail support**.

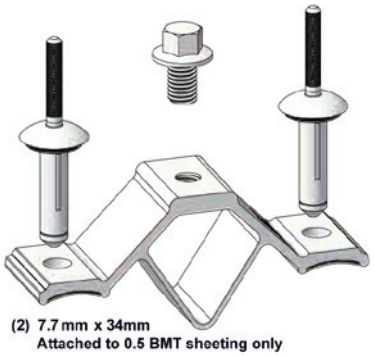
AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (MM)	REGION B (MM)	REGION C (MM)	REGION D (MM)
	5 Meters	2100	1200	N/A	N/A
	10 Meters	1800	1000	N/A	N/A
	15 Meters	1600	900	N/A	N/A
	20 Meters	1450	800	N/A	N/A

The following table represents clamp spacing (module tilt parallel to roof pitch) or rail spacing (module tilt perpendicular to roof pitch) with a 30° tilted rail support.

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	MODULE TILT PARALLEL TO ROOF PITCH (CLAMP)		MODULE TILT PERPENDICULAR TO ROOF PITCH (RAIL)	
		REGION A (MM)	REGION B (MM)	REGION A (MM)	REGION B (MM)
	5 Meters	1800	1200	2500	1600
	10 Meters	1500	1000	2100	1400
	15 Meters	1400	900	1900	1300
	20 Meters	1300	800	1800	1200

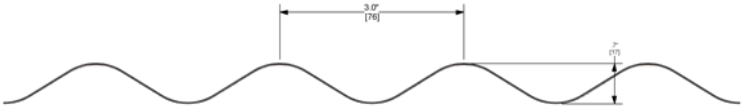
The figures above are based on attaching PV modules that are 1.5m^2 weighing 22kg. These figures should be sufficient for installing smaller PV modules. These figures also assume that determination has been made that the PV support rail, which is attached to the S-5!® clamps or brackets, is structurally adequate.

TopFix CorruBracket-AU™ Mini – 0.5 BMT



0.5 BMT Roof Profiles:

- Corrugated Roof



The following table represents the number of clamps along one side of the module frame using the S-5-PV Kit and EdgeGrab™

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (NO. OF CLAMPS) S-5-PV KIT	REGION A (NO. OF CLAMPS) EDGEGRAB™	REGION B (NO. OF CLAMPS) S-5-PV KIT	REGION B (NO. OF CLAMPS) EDGEGRAB™
	5 Meters	2	2	2	2
	10 Meters	2	2	2	2
	15 Meters	2	2	2	2
	20 Meters	2	2	2	2

The following table represents clamp spacing with a **rail support**.

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (MM)	REGION B (MM)	REGION C (MM)	REGION D (MM)
	5 Meters	1800	1200	N/A	N/A
	10 Meters	1500	1000	N/A	N/A
	15 Meters	1400	900	N/A	N/A
	20 Meters	1300	800	N/A	N/A

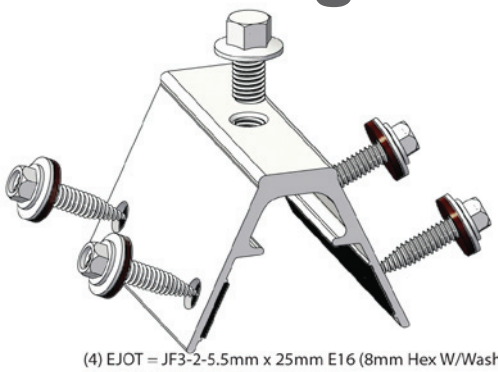
The following table represents clamp spacing (module tilt parallel to roof pitch) or rail spacing (module tilt perpendicular to roof pitch) with a 30° tilted rail support.

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	MODULE TILT PARALLEL TO ROOF PITCH (CLAMP)		MODULE TILT PERPENDICULAR TO ROOF PITCH (RAIL)	
		REGION A (MM)	REGION B (MM)	REGION A (MM)	REGION B (MM)
	5 Meters	1800	1200	2500	1600
	10 Meters	1500	1000	2100	1400
	15 Meters	1300	900	1900	1300
	20 Meters	1200	800	1800	1200

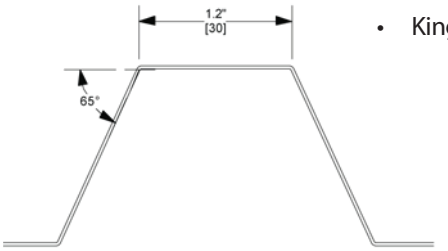
The figures above are based on attaching PV modules that are 1.5m^2 weighing 22kg. These figures should be sufficient for installing smaller PV modules. These figures also assume that determination has been made that the PV support rail, which is attached to the S-5!® clamps or brackets, is structurally adequate.

Wind Region Specs

TrapBracket™ – 0.7 BMT



(4) EJOT = JF3-2-5.5mm x 25mm E16 (8mm Hex W/Washer)
Attached to .07 BMT sheeting only



0.7 BMT Roof Profiles:

- Kingspan - KS1000 RW

The following table represents the number of clamps along one side of the module frame using the S-5-PV Kit and EdgeGrab™

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (NO. OF CLAMPS) S-5-PV KIT	REGION A (NO. OF CLAMPS) EDGEGRAB™	REGION B (NO. OF CLAMPS) S-5-PV KIT	REGION B (NO. OF CLAMPS) EDGEGRAB™
	5 Meters	2	2	2	2
	10 Meters	2	2	2	2
	15 Meters	2	2	2	2
	20 Meters	2	2	2	2

The following table represents clamp spacing with a **rail support**.

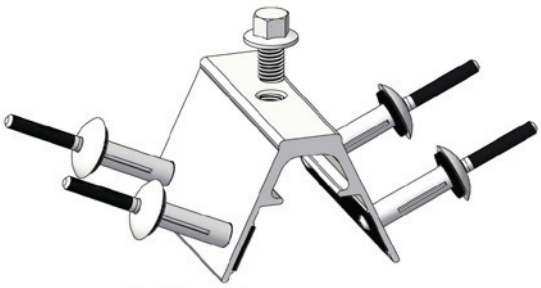
AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (MM)	REGION B (MM)	REGION C (MM)	REGION D (MM)
	5 Meters	1800	1200	N/A	N/A
	10 Meters	1500	1000	N/A	N/A
	15 Meters	1400	900	N/A	N/A
	20 Meters	1300	800	N/A	N/A

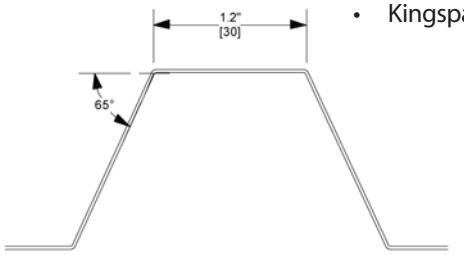
The following table represents clamp spacing (module tilt parallel to roof pitch) or rail spacing (module tilt perpendicular to roof pitch) with a 30° tilted rail support.

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	MODULE TILT PARALLEL TO ROOF PITCH (CLAMP)		MODULE TILT PERPENDICULAR TO ROOF PITCH (RAIL)	
		REGION A (MM)	REGION B (MM)	REGION A (MM)	REGION B (MM)
	5 Meters	1800	1200	2500	1600
	10 Meters	1500	1000	2100	1400
	15 Meters	1300	900	1900	1300
	20 Meters	1200	800	1800	1200

The figures above are based on attaching PV modules that are 1.5m^2 weighing 22kg. These figures should be sufficient for installing smaller PV modules. These figures also assume that determination has been made that the PV support rail, which is attached to the S-5!® clamps or brackets, is structurally adequate.

TrapBracket™ – 0.5 BMT





0.5 BMT Roof Profiles:

- Kingspan - KS1000 RW

The following table represents the number of clamps along one side of the module frame using the S-5-PV Kit and EdgeGrab™

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (NO. OF CLAMPS) S-5-PV KIT	REGION A (NO. OF CLAMPS) EDGEGRAB™	REGION B (NO. OF CLAMPS) S-5-PV KIT	REGION B (NO. OF CLAMPS) EDGEGRAB™
	5 Meters	2	2	2	2
	10 Meters	2	2	2	2
	15 Meters	2	2	2	2
	20 Meters	2	2	2	2

The following table represents clamp spacing with a **rail support**.

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	REGION A (MM)	REGION B (MM)	REGION C (MM)	REGION D (MM)
	5 Meters	2100	1200	N/A	N/A
	10 Meters	1800	1000	N/A	N/A
	15 Meters	1600	900	N/A	N/A
	20 Meters	1450	800	N/A	N/A

The following table represents clamp spacing (module tilt parallel to roof pitch) or rail spacing (module tilt perpendicular to roof pitch) with a 30° tilted rail support.

AUSTRALIAN STANDARD 1170	INSTALLATION HEIGHT	MODULE TILT PARALLEL TO ROOF PITCH (CLAMP)		MODULE TILT PERPENDICULAR TO ROOF PITCH (RAIL)	
		REGION A (MM)	REGION B (MM)	REGION A (MM)	REGION B (MM)
	5 Meters	1800	1200	2500	1600
	10 Meters	1500	1000	2100	1400
	15 Meters	1400	900	1900	1300
	20 Meters	1300	800	1800	1200

The figures above are based on attaching PV modules that are 1.5m^2 weighing 22kg. These figures should be sufficient for installing smaller PV modules. These figures also assume that determination has been made that the PV support rail, which is attached to the S-5![®] clamps or brackets, is structurally adequate.

Clamp Orientation

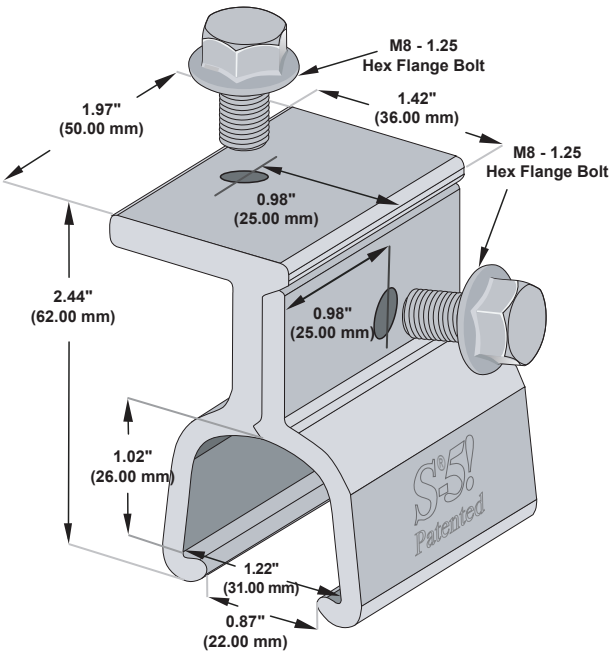
S-5-K700

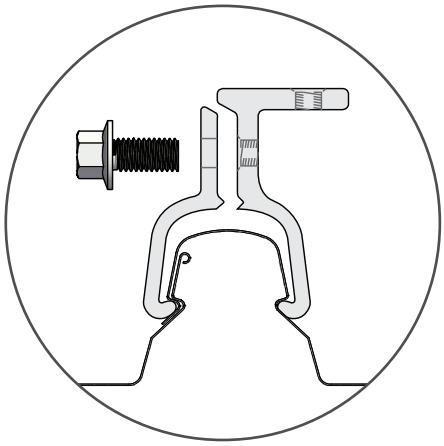
4. Orientation of Clamps

4.1 S-5-K700

S-5-K700 attaches to the roof sheeting rib by the tightening one M8 hex flange stainless steel bolt joining the two portions of the clamp usually using an industrial grade screw gun. The clamp compresses the roof panel rib material against the opposite walls of each side of the clamp. The closed clamp connection will deform the panel rib material causing a compression fit between the clamp and the roof panel seam material, but does not pierce metal roof paneling. Threaded holes in the clamp and the A2 stainless steel hardware are used to attach the ancillary items to the clamps.

The S-5-K700 is furnished with two 300-series stainless steel M8 (1.25 x 16mm) hex flange bolts with a 13mm hex head. The clamp is made of structural 6061 T6 aluminium and is compatible with most common metal roofing materials, excluding copper.





Please note: All measurements are rounded to the second decimal place.

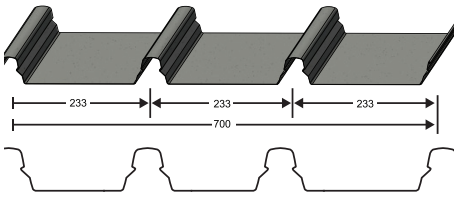
S-5-K700 Profiles

S-5-K700 Clamp

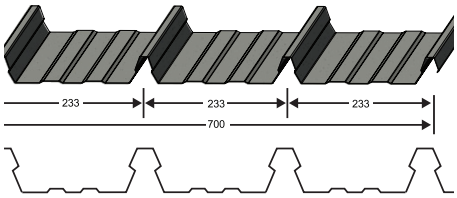
The S-5-K700 clamp was designed with patented S-5!® zero penetration technology for application needs with the very distinctive roof profiles of Stramit Speed Deck Ultra®, Lysaght Klip-Lok 700 Hi-Strength®, Fielders KingKlip® 700 and roofing types with similar profiles.

For load critical applications such as attaching solar panels, the assembly should be specifically engineered to each individual project to ensure maximum hold.
See www.S-5au.com for full details.

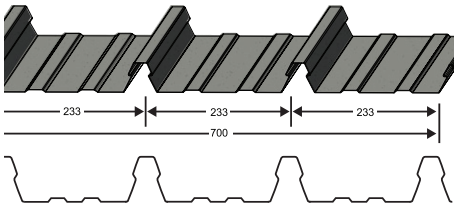
Example Roof Profiles



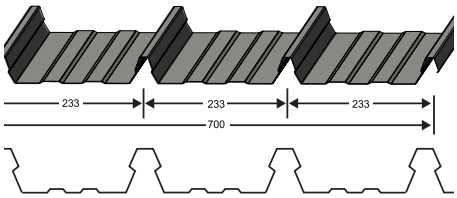
BLUESCOPE / LYSAGHT - KLIP-LOK 700 HI-STRENGTH®



METROLL - METLOK 700®



STRAMIT - SPEED DECK ULTRA®



FIELDERS - KINGKLIP®

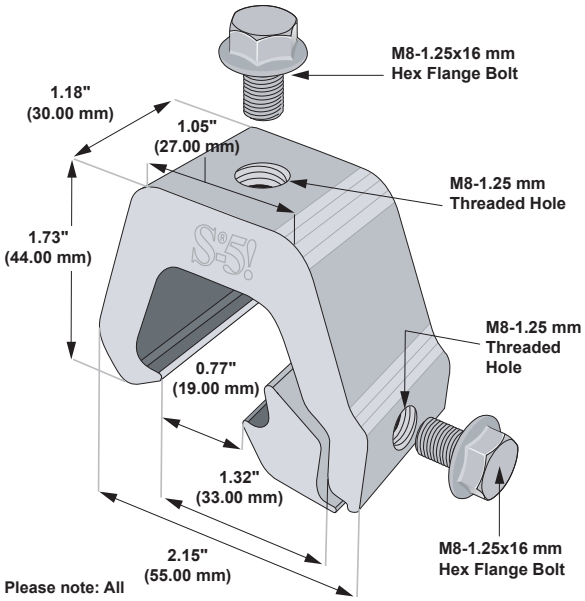
Clamp Orientation

4.2 S-5-K Grip™ Mini with GXM 10 or GXM 50 Insert

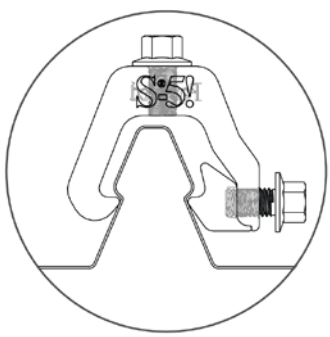
S-5-K Grip™ Mini clamp attaches to the roof sheeting rib by the tightening one M8 hex flange stainless steel bolt against the clamp insert usually using an industrial grade screw gun. The insert compresses the roof panel rib material against the opposite wall of the clamp. The insert/clamp connection will deform the panel rib material causing a compression fit between the clamp and the roof panel seam material, but does not pierce metal roof paneling. Threaded holes in the clamp and the A2 stainless steel hardware are used to attach the ancillary items to the clamps.

The S-5-K Grip Mini with GXM 10 or GXM 50 insert is furnished with two 300-series stainless steel M8 (1.25 x 16mm) hex flange bolts with a 13mm hex head. The clamp is made of structural 6061 T6 aluminium and is compatible with most common metal roofing materials, excluding copper.

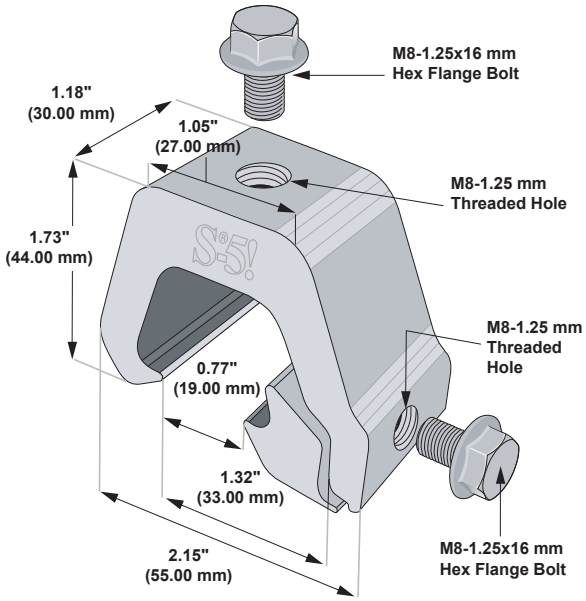
S-5-K Grip Mini
with S-5-GXM 10

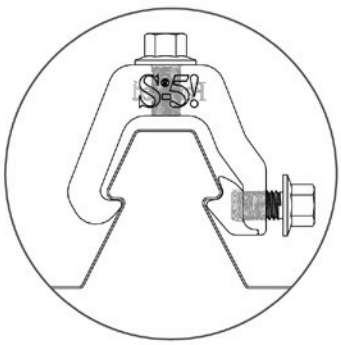


Please note: All measurements are rounded to the second decimal place.

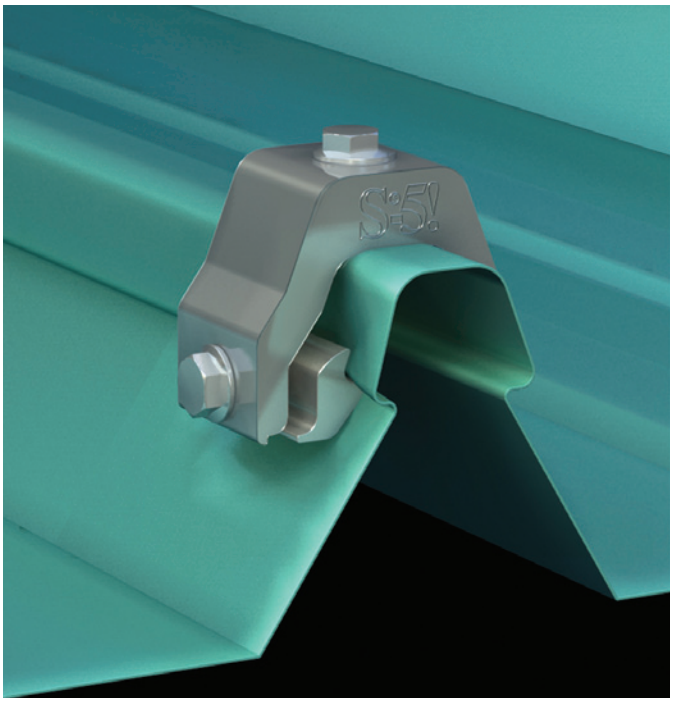


S-5-K Grip™ Mini
with S-5-GXM 50





S-5-K Grip Mini Profiles

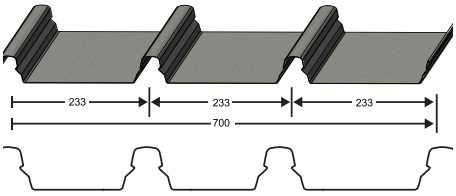


S-5-K Grip Mini Clamp

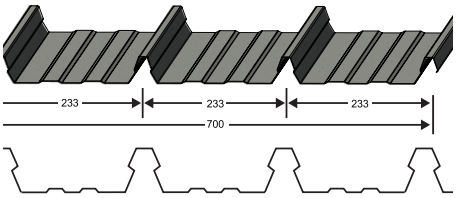
The S-5-K Grip Mini clamp was specifically developed to fit Klip-Rib® and other bulb snap-together seams. The design utilizes multiple inserts (sold separately) in order to accommodate a variety of bulb snap-together profiles. Each insert has a unique shape that allows for a tight fit and provides increased holding strength over other attachment options.

The S-5-K Grip mini also eliminates the large moment arm other clamps use for these profiles. Instead, it features a low mounting surface area, with the mounting bolt directly over the center of the seam. This dramatically increases the strength of the clamp, making it perfect for use with heavy-duty applications.

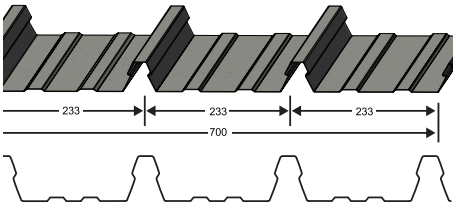
Example S-5-GXM 50 Insert Roof Profiles



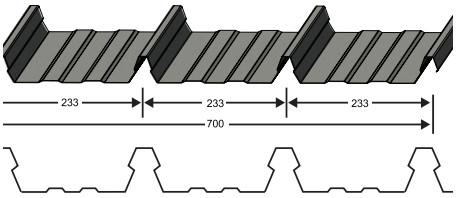
BLUESCOPE / LYSAGHT - KLIP-LOK 700 HI-STRENGTH®



METROLL - METLOK 700®

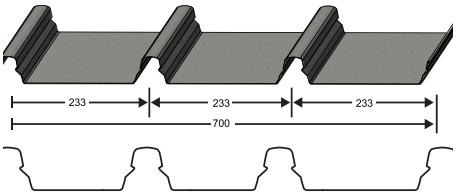


STRAMIT - SPEED DECK ULTRA®



FIELDERS - KINGKLIP®

Example S-5-GXM 10 Insert Roof Profiles



BLUESCOPE / LYSAGHT - KLIP-LOK 406

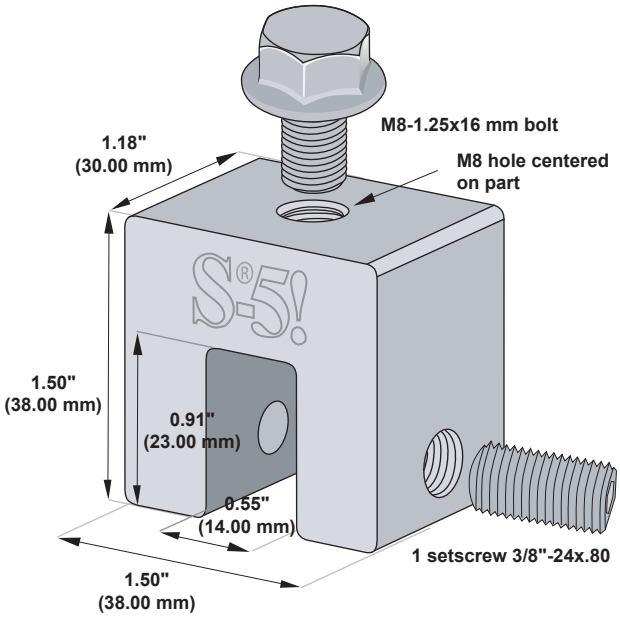
Clamp Orientation

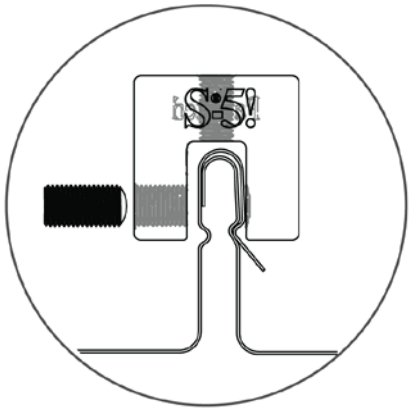
S-5-S Mini

4.3 S-5-S Mini

S-5-S Mini clamp attaches to the roof panel seam by the tightening of a round-point stainless steel setscrew against the seam material usually using an industrial grade screw gun. The round-point stainless steel setscrew compress the seam material causing an interlock/friction connection between the setscrew and the roof panel seam material, but does not pierce metal roof paneling. Threaded holes in the clamp and stainless steel hardware are used to attach the ancillary items to the clamps.

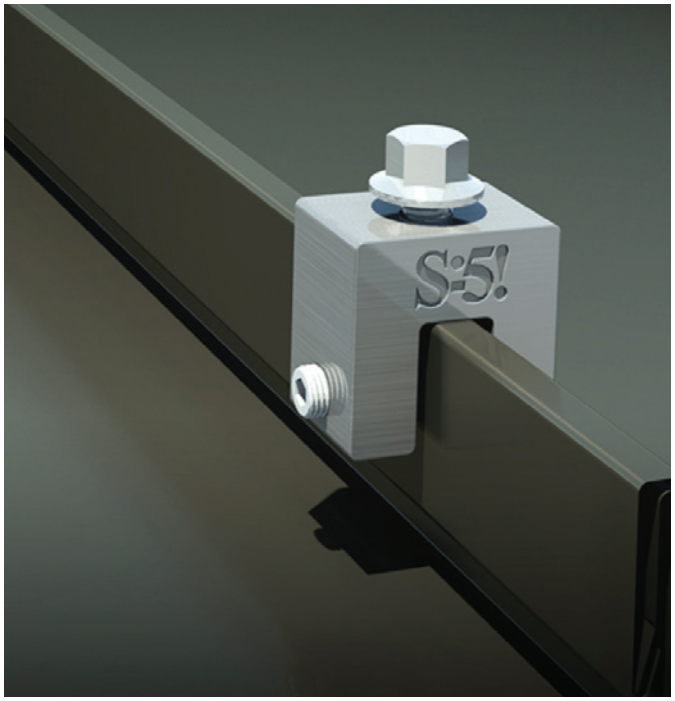
The S-5-S Mini is furnished with one 300-series stainless steel M8 (1.25 x 16mm) hex flange bolt with a 13mm hex head, and one stainless steel 3/8 (24 x .80mm) round-point setscrew. Each box includes a bit tip for tightening setscrews using an electric screw gun. The clamp is made of structural 6061 T6 aluminium and is compatible with most common metal roofing materials, excluding copper.





Please note: All measurements are rounded to the second decimal place.

S-5-S Mini Profiles

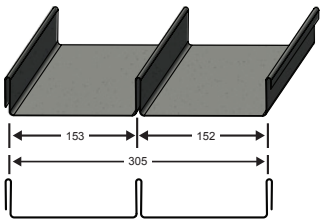


S-5-S Mini Clamp

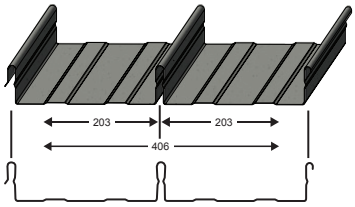
The S-5-S Mini was created specifically for popular snap-together profiles.

The S-5-S Mini is a bit shorter than the S-5-S and has one setscrew rather than two. The mini is the choice for attaching all kinds of rooftop accessories: signs, walkways, satellite dishes, antennas, rooftop lighting, lightning protection systems, solar arrays, exhaust stack bracing, conduit, condensate lines, mechanical equipment—just about anything!

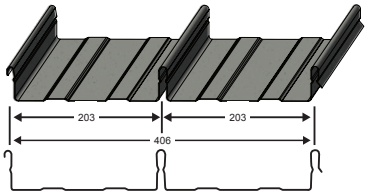
Example Profiles



BLUESCOPE / LYSAGHT - LONGLINE 305®



FIELDERS - SNAPLOK 406



STRAMIT - SNAPTITE®

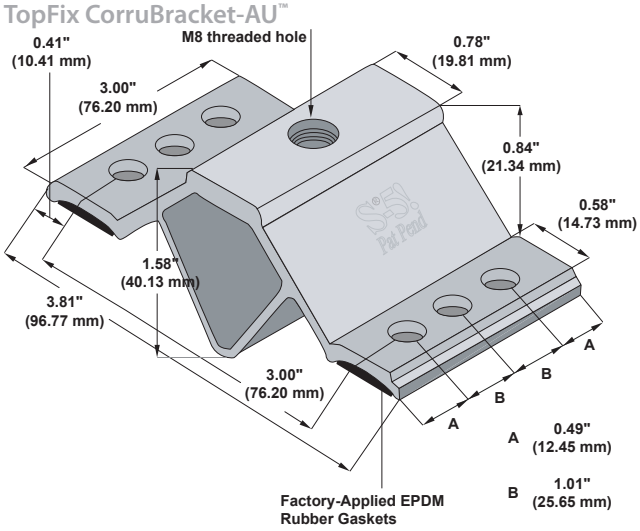
Bracket Orientation

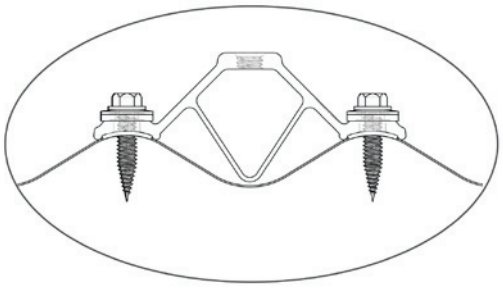
4.4 TopFix CorruBracket-AU™ and TopFix CorruBracket-AU™ Mini

The TopFix CorruBracket-AU attaches to the roof by driving self piercing screws (or Bulb-Tite Rivets) through the pre-punched holes and securing directly to the sheeting; or by driving self threading screws through the pre-punched holes into the underlying substrate using an industrial grade screw gun. The fastener compresses the roof sheeting against the bracket and the EPDM rubber gasket creating a compression seal for a water tight thru-fasten connection. Threaded holes in the bracket and the stainless steel hardware are used to attach the ancillary items to the brackets.

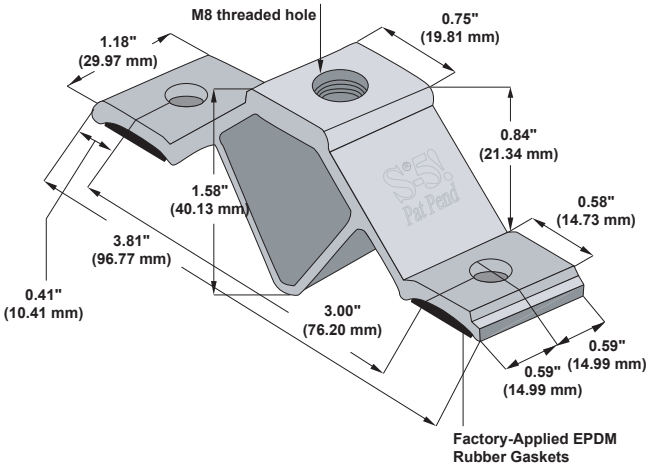
The TopFix CorruBracket-AU and TopFix CorruBracket-AU Mini are made of structural 6061 T6 aluminium and are compatible with most common metal roofing materials, excluding copper. Each bracket is furnished with a factory applied EPDM rubber gasket.

TopFix CorruBracket-AU™

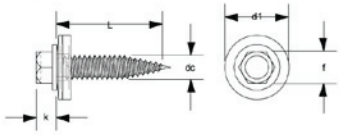




TopFix CorruBracket-AU™ Mini



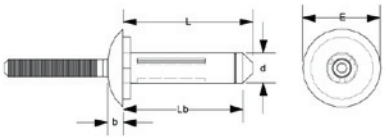
Commercially Available Fastener Options



	k	dc	L	d1	f
MM	5.5	5.5	25	15	8
INCH	.22	.22	1	.58	.30

5.5mm X 25mm (8mm Hex W/15mm Washer)

Bi-Metal stainless steel self-piercing screw with a hardened steel drill point, stainless steel washer, and a pre-assembled sealing washer.

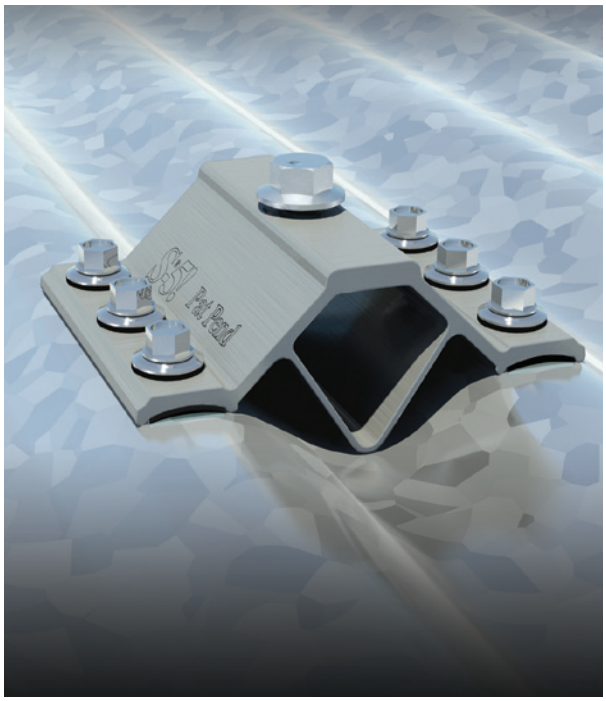


	b	d	L	E	Lb
MM	3.8	7.7	33	18.5	28
INCH	.15	.30	1.3	.73	1.1

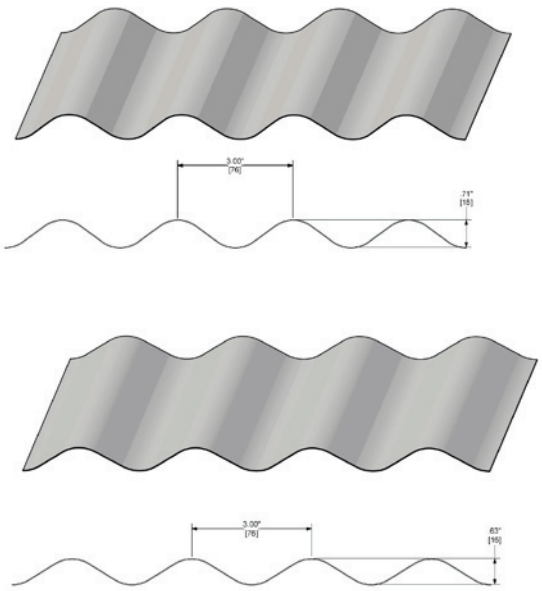
7.7mm X 28mm Alu/Alu Flat Head BULB-TITE Rivet W/16mm Washer

Please note: All measurements are rounded to the second decimal place.

TopFix CorruBracket-AU™ Profiles



Example Profiles



TopFix CorruBracket-AU™

TopFix CorruBracket-AU and TopFix CorruBracket-AU Mini are designed specifically for the Australian, Asian, and African markets and is compatible with 16–18 mm corrugated roofing profiles. Designed to accommodate attachment anywhere along the corrugation when attached to the sheeting only, or can be fixed into the underlying substrate without crushing the panels corrugation. In either case, the TopFix CorruBracket-AU leaves the valleys free of holes, further protecting against leaks!

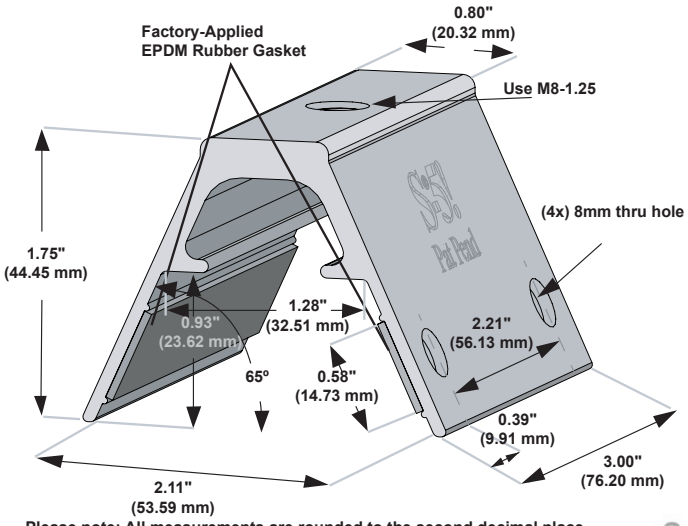
TopFix CorruBracket-AU comes with a factory-applied EPDM rubber gasket seal already on the base, and the S-5!® patented reservoir conceals the EPDM from UV exposure, preventing UV degradation as well as over compression of the sealant.

Bracket Orientation

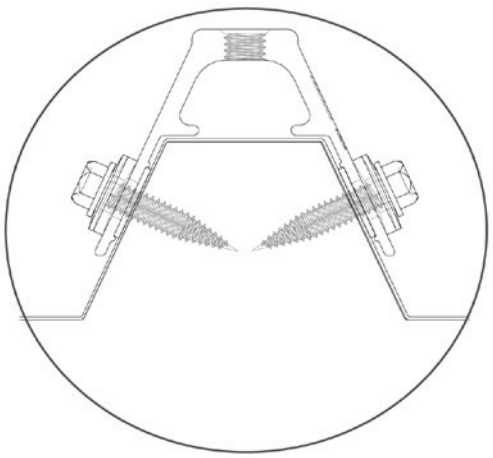
4.5 TrapBracket™

The TrapBracket attaches to the roof by driving self piercing screws (or Bulb-Tite Rivets) through the pre-punched holes and securing the bracket directly to the roof sheeting using an industrial grade screw gun. The fastener compresses the roof sheeting against the bracket and the EPDM rubber gasket creating a compression seal for a water tight thru-fasten connection. Threaded holes in the bracket and the stainless steel hardware are used to attach the ancillary items to the bracket.

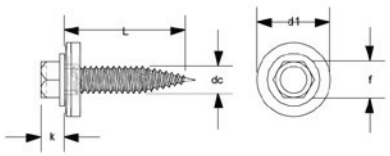
The TrapBracket is made of structural 6061 T6 aluminium and is compatible with most common metal roofing materials, excluding copper. Each bracket is furnished with a factory applied EPDM rubber gasket.



Please note: All measurements are rounded to the second decimal place.



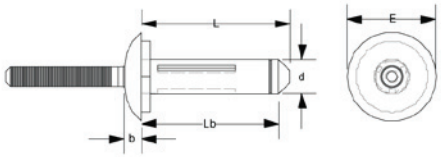
Commercially Available Fastener Options



	k	dc	L	d1	f
MM	5.5	5.5	25	15	8
INCH	.22	.22	1	.58	.30

5.5mm X 25mm (8mm Hex W/15mm Washer)

Bi-Metal stainless steel self-piercing screw with a hardened steel drill point, stainless steel washer, and a pre-assembled sealing washer.



	b	d	L	E	Lb
MM	3.8	7.7	33	16.5	28
INCH	.15	.30	1.3	.73	1.1

7.7mm X 28mm Alu/Alu Flat Head BULB-TITE Rivet W/16mm Washer

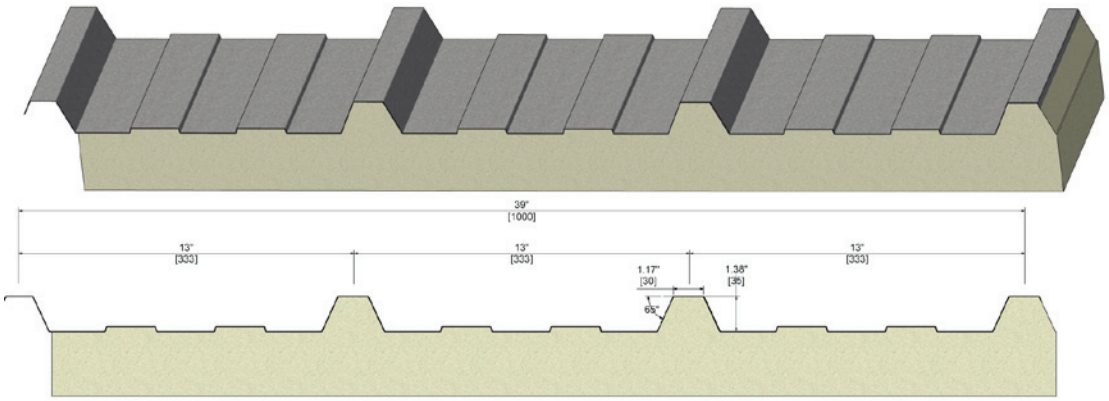
TrapBracket™ Profiles

TrapBracket™

TrapBracket can be used to mount almost anything to the Kingspan® KS1000 RW profile, or other similar exposed-fastened trapezoidal roof profiles. No messy sealants to apply! No chance for leaks! The TrapBracket comes with a factory-applied EPDM rubber gasket seal already on the base, and the S-5!® patented reservoir conceals the EPDM from UV exposure, preventing drying and cracks.

S-5! TrapBracket is the right way to attach almost anything to certain exposed-fastened trapezoidal roof profiles; including PV through DirectAttached™ or Rail methods.

Example Profile

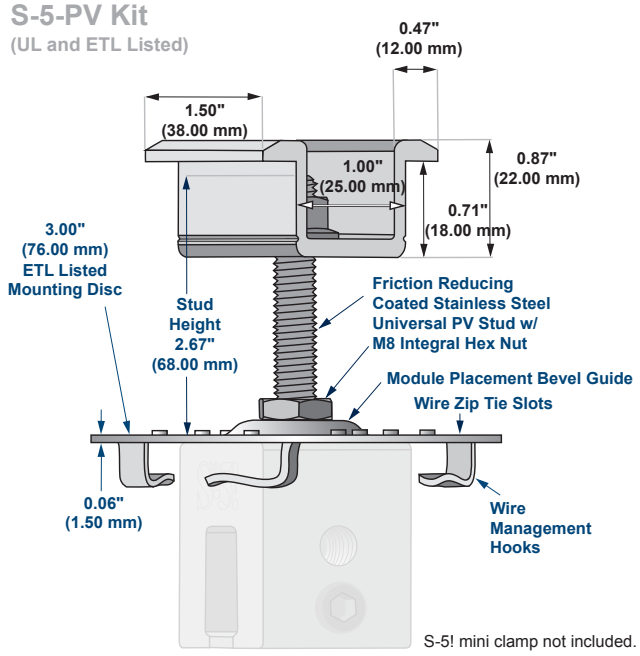


S-5!® Photovoltiac Attachment System

4.6 S-5-PV Kit

The S-5-PV Kit is furnished with the hardware shown below, excluding the attachment clamp which is supplied separately. The S-5-PV Kit is compatible with most common metal roofing materials, including brass. The S-5!® EdgeGrab™ and S-5-PV Kit together accommodate PV frame thicknesses 30–40 mm (if the L-flange is positioned below the stud's hex nut) and 34–51 mm (if the L-flange is positioned above the stud's hex nut). The embossed panel guide makes the module placement easier. The stainless steel mounting disk with twelve nodes designed to ensure the module-to-module conductivity of anodized aluminum module frames. This means the module is simply anchored with the kit and is automatically bonded. No lugs or wire required except to connect one string of modules to another and to ground the system. The mounting disk is multi-directional and rails are not required. Four strategically placed under-disk hooks assist in wire management. The PV grab ears that hold the solar panel in place are broader to allow for ease of installation and precise module engagement. Accommodating module thickness between 30 and 51 mm, the S-5-PV Kits fits the majority of solar panels on the market.

S-5-PV Kit
(UL and ETL Listed)



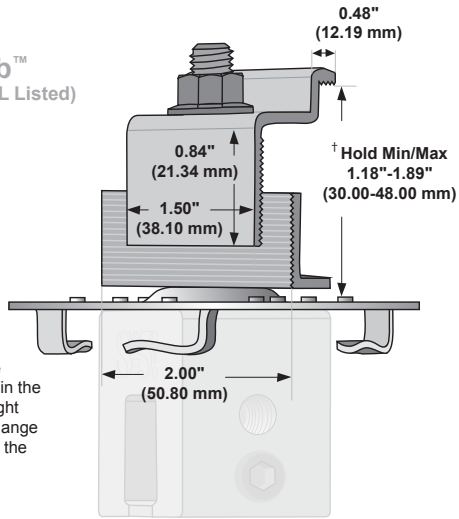
S-5! mini clamp not included.

Please Note:
Dimensions of both the Universal PV Stud and the Mounting Disk are identical between these two illustrations.

LISTED

Listed to UL subject 2703.
ETL Listed to UL 1703.*

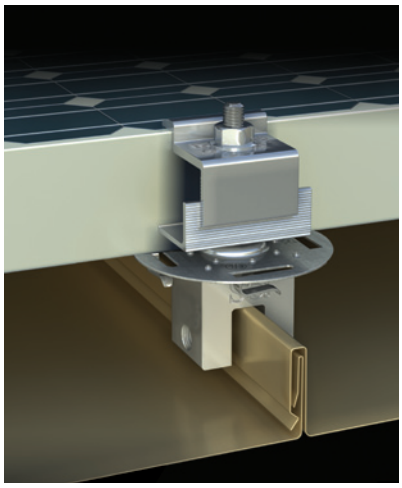
EdgeGrab™
(Not UL or ETL Listed)

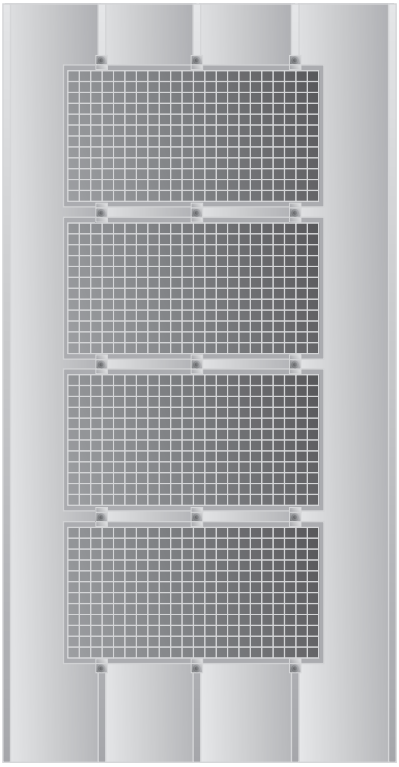


Please note: The assembly option in the diagram to the right illustrates the L-flange positioned below the stud's hex nut.

S-5! mini clamp not included.

S-5-PV Kit Hints





4.6.1 Other Helpful Hints for S-5-PV Kit Applications When Structural Capacity of Roof Panels is Unknown

The key to frequency and spacing of attachment points for PV frames utilizing the S-5-PV Kit is to distribute loads to the metal standing seam panels in a manner that is consistent with the intended distribution of loads from the roof panels into the building structure. With very few exceptions, the attachment of a single S-5!® clamp to the seam will be stronger than a single point of attachment of the seam to the building structure. Hence it is probable that the "weak link" is not the S-5! clamp, but the attachment clips that hold the metal panels to the building structure, or the beam strength of the roof panel seam itself.

The most conservative approach to the spacing/frequency of PV frame attachment to the roof is to determine the spacing/frequency of the roof's attachment to the building structure, then duplicate it at minimum, unless the project engineer says otherwise. Determining panel attachment spacing in one axis is very simple. Standing seam panels' attachment will be made using concealed hold-down clips within the seam area of the panel. So, in that axis, the clip spacing is the same as the seam spacing. The location of the clips along the seam (in the other axis) can be determined by A) consultation with the roof system manufacturer or installer, B) checking from the underside or, C) close examination from the topside along the seam. There will usually be a slight, but detectable, deformation of the seam at the clip location visible from the roof's topside. Many standing seam roof systems are installed on "pre-engineered" steel buildings. The attachment spacing is readily apparent by inspecting the spacing of the structural purlins to which the panel clips are attached from the roof underside (interior of the building).

If, for instance, the panel clips are spaced 1200mm on centre along the seam, then use the 1200mm dimension as a maximum spacing for the S-5! clamps (S-5! clamps may also be spaced at closer centres, but not wider). When modules are DirectAttached™ without racking in the landscape orientation, the smallest dimension of the PV frame dictates the spacing dimension. Using the roof panel clip spacing as a maximum spacing template for S-5! clamps is a sound practice, whether the PV modules are attached directly to the S-5! clamp or to a racking system and then to the S-5! clamp (and panel seams). To evenly distribute loads, it is also necessary that each seam be involved in the finished assembly. thus, every time a seam is traversed, it should be attached. Such an attachment scheme should evenly distribute wind loads into the building structure through the panels and their attachment, as was intended in the original roof construction assembly.

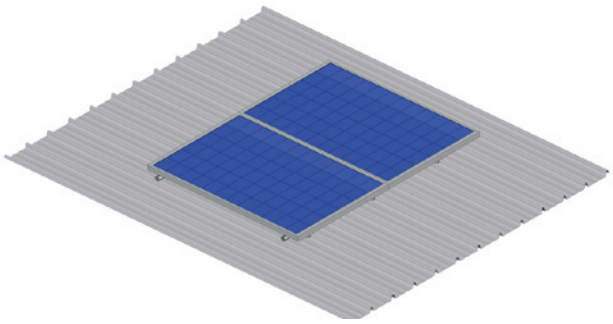
These instructions are for use by those experienced in the trade. Always follow appropriate safety precautions and use appropriate tools.

PV Rail Attachment

4.7 Rail Mounted Systems

PV rails can be installed directly to the S-5!® clamp/bracket, or with use of a flanged strap or 'L' foot. The rail should be installed perpendicular roof panel rib following the rail producer's recommended installation practices. Support rails must have sufficient flexural strength to carry possible load conditions. Support rails must also be adequately attached to the S-5! clamp, and the building structure must be sufficient to carry these loads. The makers of S-5! clamps make no representations with respect to these variables. It is the responsibility of the user to verify this information, or seek assistance from a qualified design professional, if necessary.

4.7.1 Flush Mounted Rails

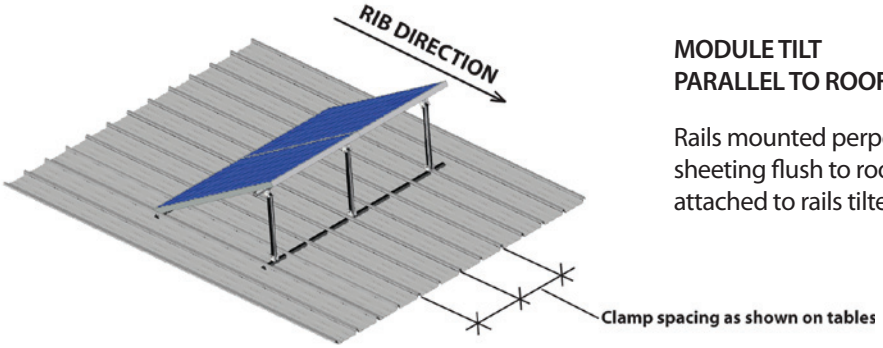


MODULES
PARALLEL TO ROOF PLANE

Rails mounted perpendicular to the roof sheeting flush to roof slope, with modules attached to rails parallel to the roof plane.

4.7.2 Tilt Mounted Rails

Caution: when tilting a PV array, a new and different airfoil is created, which may introduce loads for which the roof was not engineered. These new wind dynamics result in both positive and negative point loads that will need to be supported by the roof panels and structure.

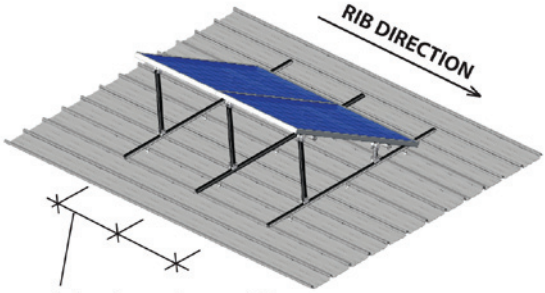


MODULE TILT
PARALLEL TO ROOF PLANE

Rails mounted perpendicular to the roof sheeting flush to roof slope, with modules attached to rails tilted parallel to the roof plane.

MODULE TILT
PERPENDICULAR TO ROOF PLANE

Rails mounted perpendicular to the roof sheeting flush to roof slope, with modules attached to rails tilted perpendicular to the roof plane.



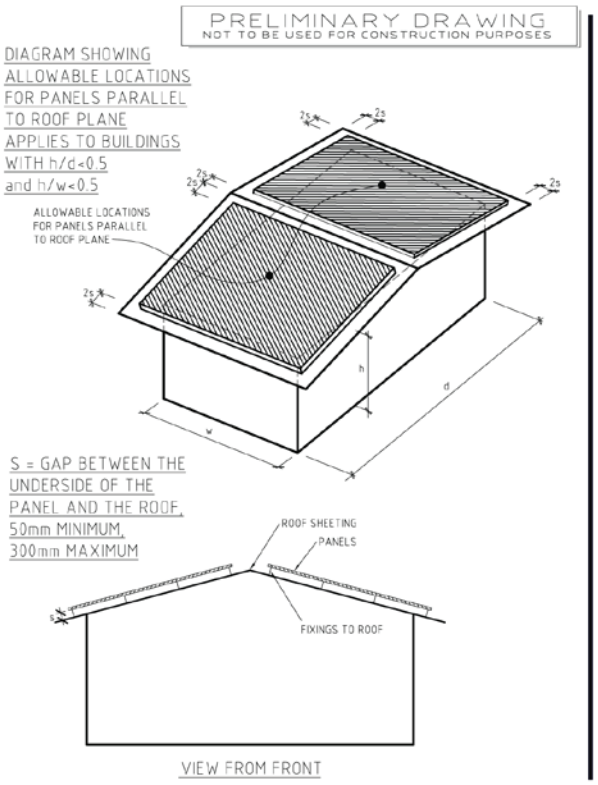
Rooftop PV Installation

5. Determine Roof Slope

A PV system attached to the S-5![®] clamp can be used for roof slopes up to 60 degrees. Please verify; the installation site roof slope should be between 0 degrees and 60 degrees.

6. Determine Roof Installation Roof Areas

A PV system attached to the S-5! clamp, or S-5-PV Kit, should not to be installed within the high wind pressure areas of the roof. Please reference below diagrams.


PRELIMINARY DRAWING
NOT TO BE USED FOR CONSTRUCTION PURPOSES
DIAGRAM SHOWING ALLOWABLE LOCATIONS FOR PANELS PARALLEL TO ROOF PLANE APPLIES TO BUILDINGS WITH h/d<0.5 and h/w<0.5
ALLOWABLE LOCATIONS FOR PANELS PARALLEL TO ROOF PLANE
S = GAP BETWEEN THE UNDERSIDE OF THE PANEL AND THE ROOF, 50mm MINIMUM, 300mm MAXIMUM
ROOF SHEETING
PANELS
FIXINGS TO ROOF
VIEW FROM FRONT

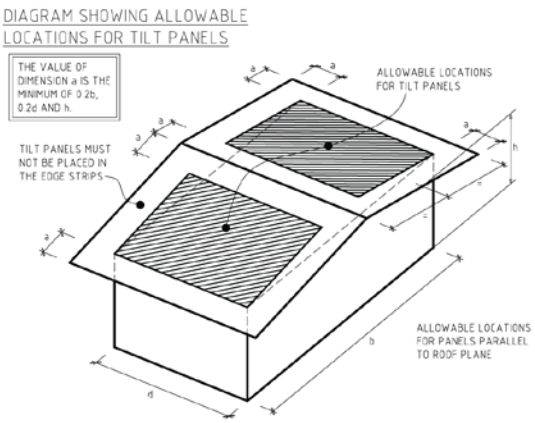


DIAGRAM SHOWING ALLOWABLE LOCATIONS FOR TILT PANELS
THE VALUE OF DIMENSION a IS THE MINIMUM OF 0.2b, 0.2d AND h.
ALLOWABLE LOCATIONS FOR TILT PANELS
TILT PANELS MUST NOT BE PLACED IN THE EDGE STRIPS
ALLOWABLE LOCATIONS FOR PANELS PARALLEL TO ROOF PLANE

Installation Tools

7. Basic tools recommended

Basic Tools		Other Referenced Tools	
Tape Measure 3/16 Allen Bit Tip (provided) S-5-S Mini String Line	Torque Wrench 13 mm Deep Well Socket Screw Gun	6" Locking Pliers or Vice Grips 13 mm Spanner or Ratchet Wrench	Angle Driver Clamp Spacing 'Jig'

(Other items may be required per field conditions.)

Clamp Installation

S-5-K700 Install

8. Installation Instructions

8.1 S-5-K700 Installation

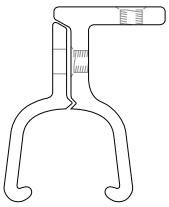
When relying upon published load values, bolts should be tensioned and verified using a calibrated torque wrench to 22 Nm.

Installation Instructions:

The S-5-K700 is designed to fit Klip Rib, Rib Roof, Lysaght Klip-Lok 700 Hi-Strength®, and similar seam profiles.

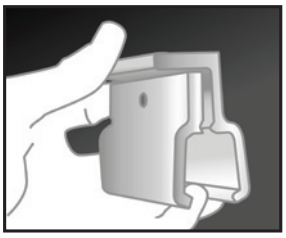
To Install S-5-K700:

1. Mate the clamp halves and start the M8 bolt. Thread bolt until bolt end is just flush with the outside surface of the opposite side of the clamp.
2. Place clamp assembly over the seam and force down until clamp snaps over seam.
3. Position clamp appropriately on seam, then close clamp using a locking C-clamp. Using a hand ratchet or electric tool (13mm), tighten M8 bolt until clamp is closed completely.
4. Remove locking C-clamp. Consult the S-5! website at **www.S-5au.com** for published data regarding holding strength.



S-5-K700

1



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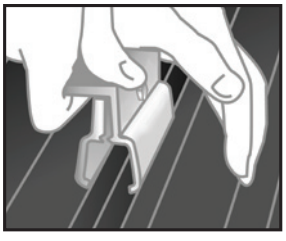

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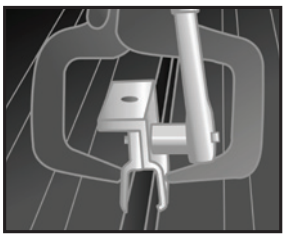

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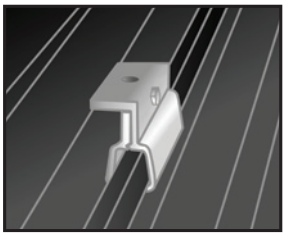


S-5-S Mini Install

8.2 S-5-S Mini Installation

When relying upon published load values, setscrews should be tensioned and verified using a calibrated torque wrench between 18 and 20 Nm when used on 8.5 mm steel and between 15 and 17 Nm for all other metals and thinner gauges of steel.

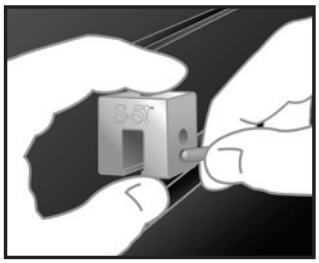
S-5! mini clamps are cost effective, non-penetrating standing seam clamps designed for medium-duty applications. They are a bit shorter than the standard clamps, having one setscrew rather than two.

The S-5-S Mini is designed to fit snap together standing seam profiles.

To Install S-5-S Mini:

1. Partially thread the setscrew into the clamp by hand
2. Determine how to position the mini clamp. On many snap-together type seams, the setscrew is opposite the open (or overlap) side of the seam. On other seams, this aspect of clamp orientation is not critical.
3. Tighten the setscrew at the base of the clamp using a screw gun and the included screw gun bit tip. For optimal holding strength, setscrew should be tensioned to 18 to 20 Nm [160 to 180 inch pounds] on 0.85 mm [22ga steel], and 15 to 17 Nm [130 to 150 inch pounds] on all other metals and thinner gauges of steel.

1



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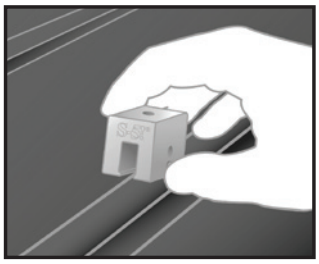

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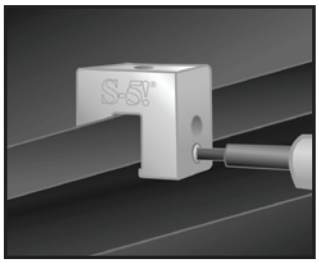


Clamp Installation

S-5-K Grip Mini Install

8.3 S-5-K Grip Mini Installation

When relying upon published load values, bolts should be tensioned and verified using a calibrated torque wrench to 22 Nm.

The S-5-K Grip Mini utilizes multiple inserts (sold separately) in order to accommodate a variety of bulb snap-together profiles. Each insert has a unique shape that allows for a tight fit and provides increased holding strength over other attachment options.

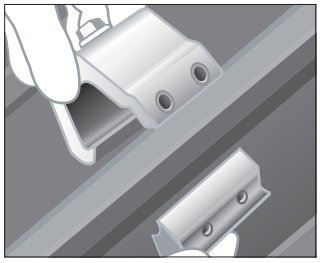
The appropriate seam profiles for each insert option are listed on the next page of these installation instructions.

The head of the clamp's flanged bolts control the amount of compression, which reduces the possibility of over-compressing the seam, and makes installation a snap!

To Install S-5-K Grip Mini:

1. Position clamp insert at desired location along the rib, just under the fold of the rib.
2. Roll the clamp into position over the seam and clamp insert piece. Position the clamp so that it is centered over the clamp insert with approximately 2mm of insert overhang on each side of the clamp.
3. Partially thread the single flanged bolt into the base of the S-5-K Grip Mini by hand. The bolts should engage the divots in the center of the S-5-K Grip Mini insert.
4. Tighten the bolt at the base of the S-5-K Grip Mini using a ratchet or screw gun with a 13mm hex. For optimal holding strength, bolt should be tensioned to 23Nm [200 in. lbs.]

1



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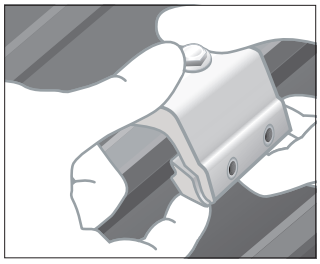

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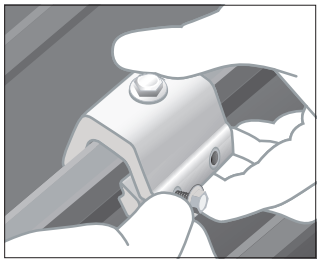

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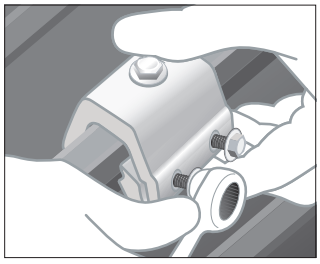


8.3.1 S-5-GXM 10 and S-5-GXM 50

SEAM PROFILES

S-5-K Grip Mini is designed to fit Klip-Rib® and other concealed fix roofing profiles.

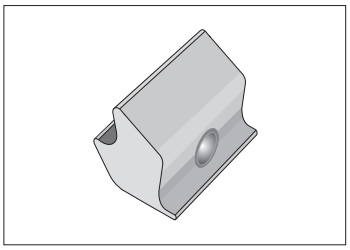
Seam profiles for the S-5-GXM 10 insert with the mini clamp:

- Lysaght Klip-lok® 406
- McElroy Metal Mirage
- AEP Span Klip-Rib®
- Metal Sales Clip-Loc
- SpeedDeck® SpeedDeck®
- Safintra Saflok 410
- Safintra Saflok 700
- Domico GBS Domitec® Dach
- And other similar profiles

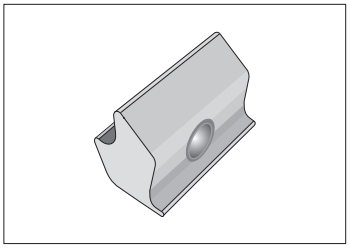
Seam profiles for the S-5-GXM 50 insert with the mini clamp:

- Lysaght Klip-lok Classic® 700
- Lysaght Klip-lok 700 Hi-Strength®
- Stramit® Speed Deck Ultra®
- Fielders KingKlip® 700
- And other similar profiles

If you have a profile not listed here, please contact S-5!® to request a sample for testing.



S-5-GXM 10 Mini Insert



S-5-GXM 50 Mini Insert

Bracket Installation

8.4 TopFix CorruBracket-AU™ and TopFix CorruBracket-AU™ Mini Installation

The TopFix CorruBracket-AU is made for corrugated roofing profiles. It is not made for folded seams or concealed fix roofing profiles and does not use setscrews.

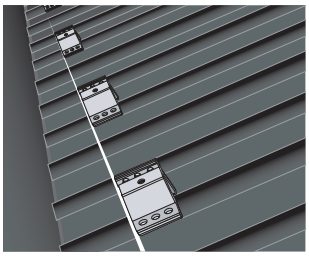
TopFix CorruBracket-AU is mounted directly onto the crest of the corrugation with proper sheet metal screws or bulb rivets. Check with your distributor for the proper fasteners as this can vary with the application.

To ensure brackets are installed in a straight line, install a single TopFix CorruBracket-AU on each end of the roof at a measured, consistent distance from the bottom edge of the roof. Use a string line between the two brackets. Mount the remaining TopFix CorruBracket-AU's along the string line, directly onto the roof. Do not remove the EPDM rubber gasket; this is for water-tightness weather-proofing.

To Install the TopFix CorruBracket-AU/TopFix CorruBracket-AU Mini:

1. Determine the location of assembly.
2. The only surface preparation necessary is to simply wipe away excess oil and debris.
3. Secure the TopFix CorruBracket-AU directly onto two adjacent crests of the roof corrugation by driving the appropriate screws into the pre-punched holes, or pre-drilling the proper sized hole through the pre-punched holes and riveting with bulb-type rivets. Secure the TopFix CorruBracket-AU, using the required amount fasteners to achieve tested necessary holding strength for your application. Do not overdrive fasteners; a slight extrusion of rubber around the washer is a good visual tightness check. If a fastener has been overdriven, it is important to remove the fastener and replace it with a bulb rivet. To avoid stripping the fastener, do not over torque; use screw gun. The TopFix CorruBracket-AU™ is now ready to install other ancillaries, such as the S-5-PV Kit, using the top M8 hole.

1



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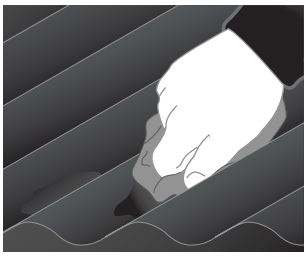

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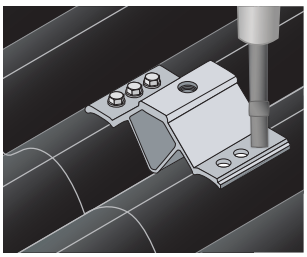


8.5 TrapBracket™ Installation

S-5!® TrapBracket™ is the right way to attach almost anything to certain exposed-fastened trapezoidal roof profiles; including PV through DirectAttached™ or Rail methods.

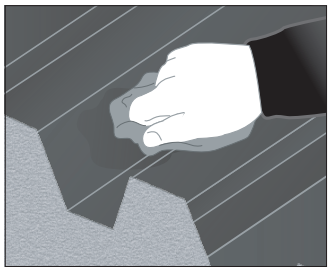
TrapBracket is mounted directly onto the crown of the trapezoidal sheet with the S-5! stainless steel 6.3x25 mm TrapBracket fasteners or 7.7 mm Bulb-tite rivets.

To ensure brackets are installed in a straight line, install a single TrapBracket on each end of the roof at a measured, consistent distance from the bottom edge of the roof. Use a string line between the two brackets. Mount the remaining TrapBrackets along the string line, directly into the roof. Do not remove the EPDM rubber gasket; this is for weather-proofing.

To Install TrapBracket:

1. The only surface preparation necessary is to simply wipe away excess oil and debris.
2. Determine the location of assembly.
3. Secure the TrapBracket directly into the crown of the roof profile by driving the appropriate fasteners into the four pre-punched holes, or pre-drilling the proper sized hole through the four pre-punched holes and riveting with bulb-type rivets. To achieve tested holding strength, secure the TrapBracket by using all four pre-punched hole locations. Drive the fastener in until it is tight and the washer is firmly seated. Do not overdrive fasteners; a slight extrusion of rubber around the washer is a good visual tightness check. If a fastener has been overdriven, it is important to remove the fastener and replace it with a bulb rivet. To avoid stripping the fastener, do not over torque; use screw gun. The TrapBracket is now ready to install other ancillaries, such as the S-5-PV Kit, using the top M8 hole.

1



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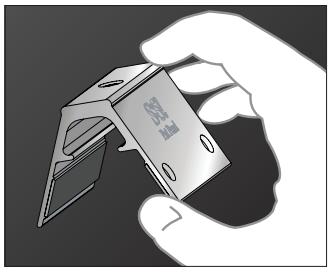

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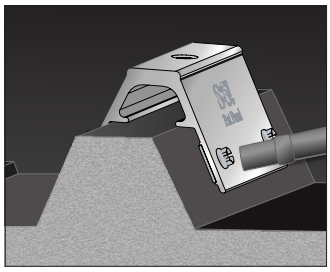


PV Installation

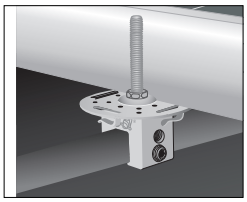
8.6 S-5-PV Kit Installation

These instructions are for use by those experienced in the trade.
Always follow appropriate safety precautions and use appropriate tools.

S-5!® Warning! Please use these products responsibly! Visit our website or contact your S-5! distributor for detailed installation instructions and available load test results. The user and/or the installer of these parts is responsible for all necessary engineering and design for the intended use of these parts in an assembly or application. Note that a continuous ground must be followed in accordance with National Electric Code (NEC), ANSI/NFPA 70. Installation in Canada must be in accordance with CSA C22.1, Safety Standard for Electrical Installations, Canadian Electrical Code, Part 1. For use with PV Modules having a maximum fuse rating of 15A or less. Prior to installation contact the local code Authority Having Jurisdiction (AHJ) to determine the proper grounding requirements.

Install S-5! mini clamp. See mini clamp installation instructions.

1. Place mounting disc on the S-5! mini clamp. Secure Universal PV stud through the mounting disc into the S-5! mini clamp. Using a 13 mm deepwell socket, tighten universal PV stud to 140–160 inch pounds. Install one PV frame on top of the mounting disc utilizing the module placement bevel guide to ensure proper placement.
2. Install a second PV frame on top of the mounting disc utilizing the module placement bevel guide to ensure proper placement.
3. Install the universal PV anchor grab to the universal PV stud, with the flanged nut to secure the two PV frames (See diagram A). Tighten flange nut to 11-13.5 Nm [100–120 inch pounds].
4. For end/edge conditions, use the EdgeGrab™. There are two assembly options for the EdgeGrab, dependent upon the PV frame thickness. For frame thicknesses 30–48 mm, install the EdgeGrab by placing the serrated L-flange on top of the mounting disk (see Diagram B). Then, drive the universal PV stud through the serrated L-flange and the mounting disk, and into the S-5! mini clamp. The L-flange will be positioned beneath the stud's hex nut. Using a 13 mm deepwell socket, tighten the universal PV stud to 140–160 inch pounds. Next, set the PV module atop the mounting disk, making the thin edge of the L-flange flush against the PV frame. Slide the top component of the EdgeGrab onto the stud, allowing the serrated sides to interlock at the appropriate height. Add the flange nut to the stud to secure the PV frame. Tighten flange nut to 100–120 inch pounds.
5. For frame thicknesses 34–51 mm, position the serrated L-flange atop the stud's hex nut. Proceed with the remainder of step four.

1


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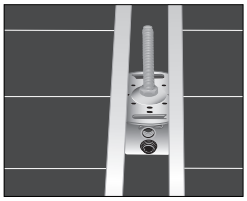

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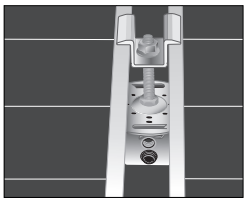

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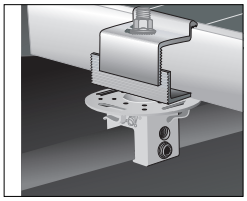

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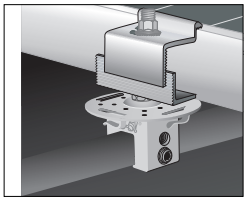
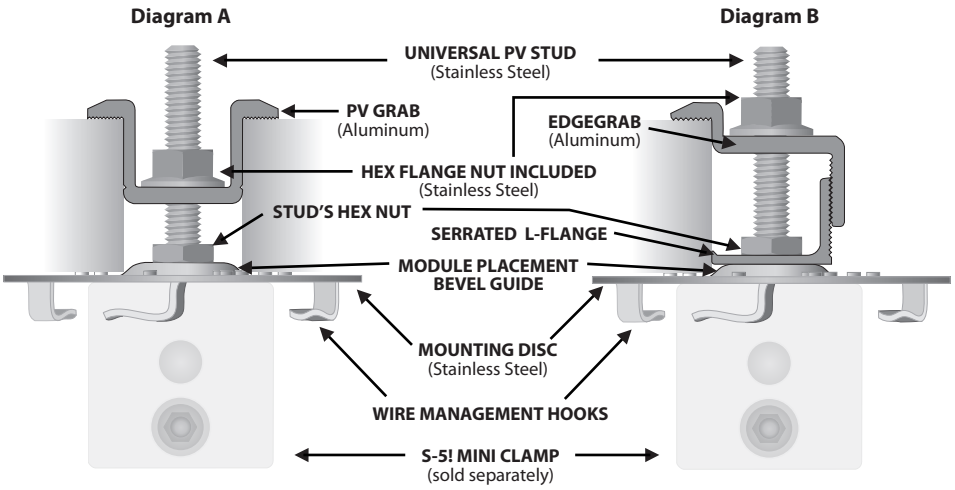
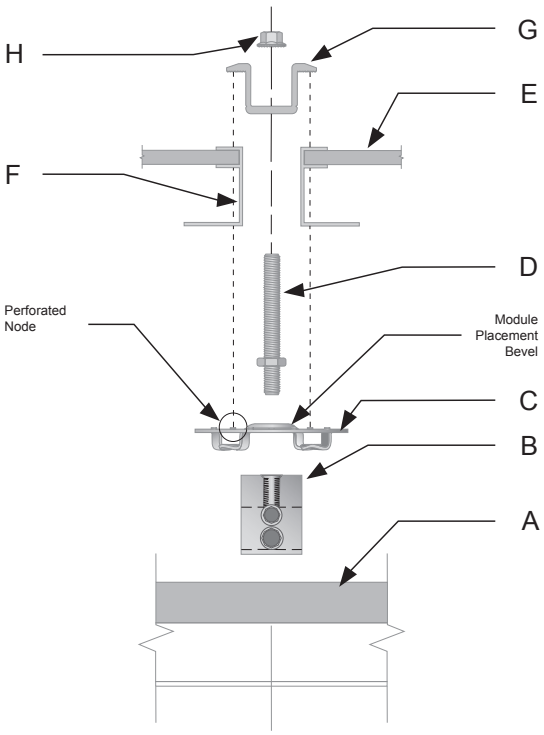


S-5-PV Kit Install

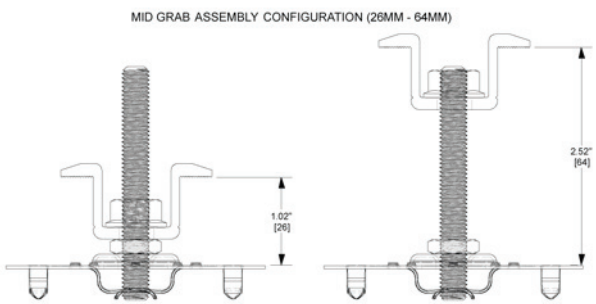


PV Mounting Assembly

Field Condition



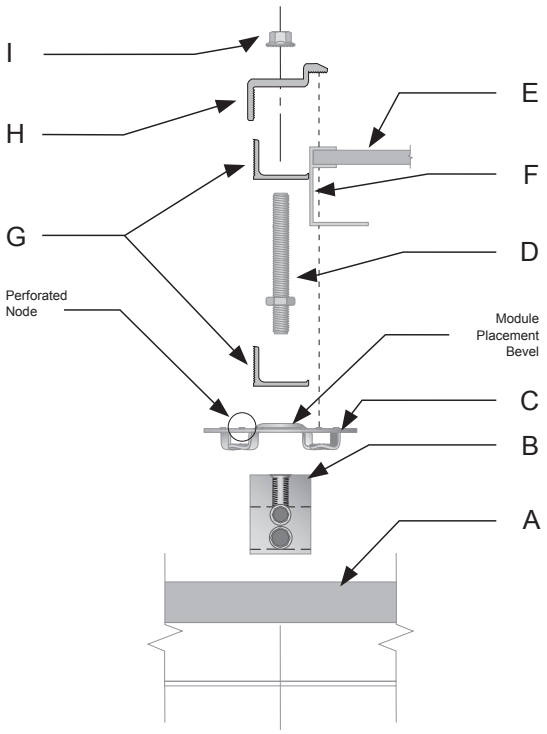
A. Standing Seam Metal Roof
B. S-5! Mini Clamp (Sold separately)
C. Stainless Steel Mounting Disc
D. Stainless Steel M8–1.25x68 mm Universal PV Stud w/hex nut(Tensioned between 140 and 160 inch pounds)
E. Glass
F. Module Frame Cross Section (Frame thickness from 1.3" [33 mm] to 2.5" [64 mm])
G. Universal PV Grab
H. Stainless Steel M8–1.25 Hex Flange Nut (Tensioned between 100 and 120 inch pounds)

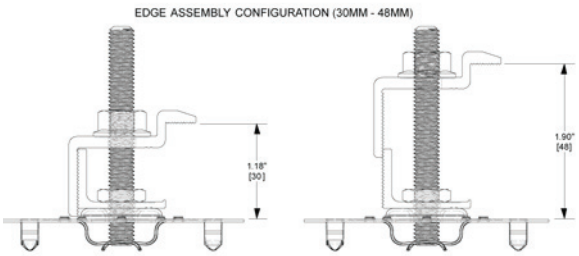


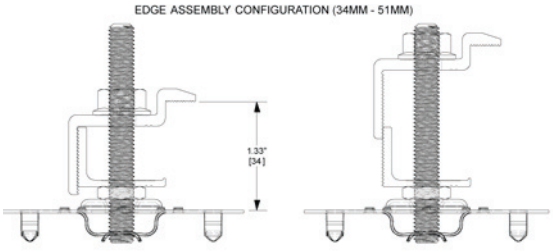
PV Installation

S-5-PV Kit Install

EdgeGrab™
Edge Condition







Disclaimer

Product Disclaimer

9. S-5!® Warning

PLEASE USE THIS PRODUCT RESPONSIBLY!

S-5! Warning! Visit our website, **www.S-5au.com** or contact your S-5! distributor for detailed installation instructions and load test results. The user and/or the installer of these parts is responsible for all necessary engineering and design for the intended use of these parts in an assembly or application.

Any loads imposed on the S-5! clamp will be transferred to the panels. Panels must be adequately attached to building structure to resist these loads. For critical installations, inquire for specific test data of ultimate tensile load on specific panel materials and seam types. When tabled values are used, screw tensions should be verified and factors of safety should be used as appropriate.

The manufacturer expresses no opinions as to the suitability of the S-5! products for any specific application or project condition.

ALWAYS PROVIDE WORKER FALL PROTECTION WHEN INSTALLING S-5!. S-5! DOES NOT APPROVE PRODUCTS FOR USE IN PERSONAL FALL RESTRAINT/FALL PROTECTION APPLICATIONS. S-5! PRODUCTS MAY BE USED AS A COMPONENT IN A FALL PROTECTION SYSTEM ONLY WHEN THE SYSTEM MANUFACTURER PROVIDES APPROPRIATE APPROVALS.

S-5!®
The Right Way!

THE RIGHT WAY TO ATTACH ALMOST ANYTHING TO METAL ROOFS!

S-5! Attachment Solutions | Metal Roof Innovations, LTD. | www.S-5au.com | +1-719-825-3432

S-5!® Warning! Please use this product responsibly!

Products are protected by multiple U.S. and foreign patents. Visit the website at www.S-5.com.au for complete information on patents and trademarks. For maximum holding strength, setscrews should be tensioned and re-tensioned as the seam material compresses. Clamp setscrew tension should be verified using a calibrated torque wrench between 160 and 180 inch pounds when used on 22ga steel and between 130 and 150 inch pounds for all other metals and thinner gauges of steel. Consult the S-5! website at www.S-5.com.au for published data regarding holding strength.

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